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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/165,248	10/01/1998	SUDHA RATHI	AMAT/2966/PD	7619

7590 03/20/2002

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EXAMINER
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FOURSON III, GEORGE R

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 03/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/165,248

Applicant(s)

RATHI ET AL.

Examiner

George Fourson

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-13 and 15-27 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-13 and 15-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

The finality of the office action mailed 11/29/01 is withdrawn in view of applicant's arguments and the new grounds of rejection below.

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "24" and "22" have both been used to designate passivation layer 24 in figure 1 while 22 should be associated with the liner layer surrounding Cu 20. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-8 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Endo et al '150 and Europe '440, of record.

3. The rejection is maintained as stated in the paper mailed 11/29/01.

4. Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Endo et al '150 and Europe '440 as applied to claims 1-8 and 10-13 above, and further in view of applicant's admitted prior art and either one of Zhao and Somekh.

5. The combination of Endo et al '150 and Europe '440 does not include formation of a SiC barrier layer, a dielectric layer on the SiC barrier layer, a SiC etch stop on the dielectric layer, a second dielectric layer on the etch stop, etching the first and second dielectric layers, forming a TaN barrier layer, forming a Cu layer and depositing a SiC passivation layer on the Cu layer.

6. Applicant admits the process of forming a barrier layer 13, a dielectric layer 14 on the barrier layer, an etch stop 16 on the dielectric layer, a second dielectric layer 18 on the etch stop, etching the first and second dielectric layers, forming a TaN barrier layer 22, forming a Cu layer 20 and depositing a passivation layer on the Cu layer to have been known prior to applicant's invention.

7. Europe '440 discloses that the SiC produced by the process therein is useful as useful as barrier layer 4, interlayer dielectric layers 5 and 9 and barrier layer 8. Somekh discloses forming SiC, low k etch stop 14 between dielectric layers (col.5, lines 33-41). Zhao discloses forming SiC etch stop 312 between dielectric layers (col.5, lines 55-61).


8. In view of the disclosures of Europe '440, Somekh and Zhao that SiC is useful as a dielectric layer, barrier layer and etch stop, it would have been within the scope of one of ordinary skill in the art to combine the teachings of Endo et al '150 and Europe '440 with those of either one of Somekh and Zhao to enable formation of the structure of instant prior art figure 1.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See MPEP 203.08.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner George Fourson whose telephone number is (703) 308-2544. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax number for this group is (703)308-7722( 7724,3431 and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

  
George Fourson  
Primary Examiner  
Art Unit 2823

GFourson  
March 18, 2002